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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/847,420	05/03/2001	Shuji Yamada	35.C15513	5480

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EXAMINER
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PERRY, ANTHONY T

ART UNIT	PAPER NUMBER
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2879

DATE MAILED: 04/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/847,420

Applicant(s)

YAMADA ET AL.

Examiner

Anthony T Perry

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 5/3/01.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☒ Claim(s) 19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Objections*

Claim 19 is objected to because of the following informalities: change “metallic oxide particles chosen from Fe....” to --metallic oxide particles chosen from the oxides of Fe....--.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4-5, 9, 12-13, 17-25, and 27-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshioka et al. (US 5,872,541).

Regarding claims 1, 9 and 17, Yoshioka discloses an electron source forming substrate in Fig. 11(5) where an electron-emitting device is arranged, comprising a substrate 4 with an insulating material film 11 formed thereon at which surface an electron emitting device is disposed (see Fig. 8). Yoshioka teaches that the insulating layer can be an SiO<sub>2</sub> film (col. 11, lines 50-51). Wherein the insulating material film 11 contains a plurality of metallic oxide particles 9 (see col. 8, line 44 – col. 9, line 47). Yoshioka teaches a range for the particle size that includes values that are encompassed by the limitation of 15 nm to 30 nm (col. 14, lines 46-47).

Regarding claims 4-5 and 12-13, Yoshioka teaches a range for the thickness of the insulating/SiO<sub>2</sub> film which includes values that are encompassed by the limitation of 300 nm to 400 nm (col. 11, lines 52-55).

Furthermore, Yoshioka teaches a range of thickness for the insulating/SiO<sub>2</sub> film that is necessary for the fine metallic oxide particles to be dispersed and fixed (col. 11, lines 52-55). It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a workable range for the thickness of the insulating/SiO<sub>2</sub> film, since optimization of workable ranges is considered within the skill of the art.

Regarding claims 18-20, Yoshioka teaches the metallic oxide particles being SnO<sub>2</sub> particles which are electron conduction oxide particles (col. 14, lines 46-47).

Regarding claim 21, Yoshioka discloses that the substrate is made of glass which inherently contains Na (col. 5, line 62).

Regarding claim 22, Yoshioka discloses that the substrate is an electron source forming substrate on which an electron source is formed (see Fig. 36).

Regarding claim 23, Yoshioka discloses a conductive film 3a containing an electron-emitting portion 10 (col. 31, lines 39-52).

Regarding claim 24, Yoshioka discloses a plurality of electron-emitting devices arranged in a matrix wiring composed of a plurality of row directional wirings and a plurality of column directional wirings (see Fig. 39a-d).

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Regarding claim 25, Fig. 36 of the Yoshioka reference discloses an electron-emitting device that is an electron-emitting device comprising a conductive film 3a containing the electron-emitting portion between one pair of electrodes 1,2.

Regarding claim 27 and 29, Yoshioka discloses an image display apparatus comprising an envelope, an electron-emitting device arrangement in a matrix wiring composed of a plurality of row directional wirings and a plurality of column directional wirings and an image display member for displaying images by irradiation of the electron from the electron-emitting devices where the substrate is as claimed in claim 1 and 9 (col. 32, line 36 – col. 33, line 32).

Claim 28 recites essentially the same limitations of claim 23. Thus claim 28 is rejected as claim 23 (see rejection of claim 23).

Claim 30 recites essentially the same limitations of claim 25. Thus claim 30 is rejected as claim 25 (see rejection of claim 25).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-3 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshioka et al (US 5,872,541) in view of Khan et al. (US 5,598,052)

Regarding claims 2 and 10, Yoshioka does not specifically state that the SiO<sub>2</sub> layer contains phosphorus. However, it is well known in the art that for certain bonding processes, it

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is desirable that the surfaces be planarized. This can be accomplished by depositing phosphorus-doped silicon dioxide and polishing the surface. Alternatively a smooth surface can be obtained by depositing phosphorous-doped silicon dioxide and reflowing it (col. 6, lines 55-61). Accordingly, one of ordinary skill in the art at the time the invention was made would have found it obvious to have the insulating/SiO<sub>2</sub> layer be doped with phosphorus so as to create a smooth flat surface.

Regarding claims 3 and 11, the combination of Yoshioka and Khan discloses the claimed invention except for the limitation of the SiO<sub>2</sub> layer containing phosphorus in a range of 1-10% by wt. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a workable range, since optimization of workable ranges is considered within the skill of the art.

Claims 6-8 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshioka et al (US 5,872,541).

Regarding claims 6-8 and 14-16, Yoshioka does not specifically teach the use of another SiO<sub>2</sub> film being deposited over the SiO<sub>2</sub> film that contains the metallic oxide particles. However, it is well known to use an insulating layer such as SiO<sub>2</sub> as a flattening film before depositing the electrodes as evidenced in Fig. 30a-d. In this embodiment, a second SiO<sub>2</sub> layer 5b is formed over the first SiO<sub>2</sub> layer 5a and the metallic oxide particles 9 to provide a flat surface for the electrode 2 to be deposited on. Since the SiO<sub>2</sub> layer 11 of Fig. 11(5) contains metallic particles 9 some of which are formed protruding outside the SiO<sub>2</sub> layer 11 one of ordinary skill in the art would at the time the invention was made would have found it obvious to include another SiO<sub>2</sub>

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layer over layer 11 so as to ensure a flattened surface for the electrodes. It is noted that in Fig. 11(5) the metallic oxide particles 9 are formed in the insulating layer 11 only between the electrodes. However, to simplify the manufacturing steps one of ordinary skill in the art at the time the invention was made would have found it obvious to impregnate the entire layer 11 with metallic oxide particles in which case the second SiO<sub>2</sub> layer would be needed to provide a flattened surface for the electrodes. The second SiO<sub>2</sub> layer 5b of Fig. 30a-d is disclosed to have a thickness that is included in the limitation of 40 nm to 100 nm (col. 29, lines 41-45).

Claims 26 and 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshioka et al (US 5,872,541) in view of Kaneko et al. (US 5,831,387).

Regarding claims 26 and 31, the electrodes of the Yoshioka reference are composed of platinum as the principal component (col. 23, line 41). The Yoshioka reference is silent with respect to what material the wirings are composed of. However the use of wirings comprising silver as the principal component is well known in the art as evidenced by Kaneko (col. 13, line 61 – col. 14, line 9). Accordingly, one of ordinary skill in the art would have found it obvious at the time the invention was made to have used wirings of composed of silver.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Tomihari et al. (US 6,091,188); Jones et al. (US 5,965,898) ; Nishimura et al. (US 6,208,071) ; Nomura et al. (US 6,459,207) ; Oda et al. (US 6,492,769) ; Shibata (US 6,522,054) ; and Nishimura et al. (EP 0,850,892).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to *Anthony Perry* whose telephone number is (703) 305-1799. The

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examiner can normally be reached between the hours of 9:00AM to 5:30PM Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel, can be reached on (703) 305-4794. The fax phone number for this Group is (703) 308-7382.

Communications via Internet e-mail regarding this application, other than those under 35 U.S.C. 132 or which otherwise require a signature, may be used by the applicant and should be addressed to [Anthony.perry@uspto.gov].

*All Internet e-mail communications will be made of record in the application file. PTO employees do not engage in Internet communications where there exists a possibility that sensitive information could be identified or exchanged unless the record includes a properly signed express waiver of the confidentiality requirements of 35 U.S.C. 122. This is more clearly set forth in the Interim Internet Usage Policy published in the Official Gazette of the Patent and Trademark on February 25, 1997 at 1195 OG 89.*

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.



Anthony Perry  
Patent Examiner  
Art Unit 2879  
April 7, 2003



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